

In re Appln. of Jurczyk et al  
Application No. 10/058,561

The following listing of claims replaces and supercedes any prior listing of claims:

**Listing of Claims:**

Claims 1-7 (Withdrawn).

Claims 8-27 (Cancelled).

Claims 28-44 (Withdrawn).

Claims 45-67 (Cancelled).

68.(Currently Amended) A method of producing neutrons in a chamber containing an anode electrode, a ~~semi-transparent~~ suppressor cathode electrode, consisting of a semi-transparent electrically-conducting material that limits electron flow to said anode, and a semi-transparent leeching cathode electrode, consisting of a semi-transparent electrically-conducting material that removes electrons, comprising the steps of; introducing a fusible gas, comprising either deuterium gas or a mixture of deuterium and tritium gas, into the vacuum chamber; creating ~~a voltage differential~~ high voltage differentials between the cathode electrodes, comprised of said suppressor electrode and said leeching electrode, and the said anode electrode, and applying a high voltage to the leeching cathode, and a bias voltage to the suppressor electrode relative to the leeching cathode, whereby and a bias voltage to said suppressor electrode relative to said leeching cathode, such that a high-pressure high-resistance gaseous discharge forms primarily between the said anode and semi-transparent suppressor surfaces said cathode electrodes and extends through the openings of the said semi-transparent suppressor electrode surfaces cathode electrodes, passing through the said suppressor electrode and said leeching electrodes electrode and an intra-cathode region defined by at least one surface of the cathode electrode the volume enclosed by said suppressor electrode, and whereby such that ions selected resulting from said gaseous discharge and constituted from the group consisting of ~~deuterium ions and tritium ions of said gaseous discharge~~ said fusible gas are accelerated by the said voltage differential, with a substantial portion of said ions passing through the openings of the said semi-transparent cathode surfaces electrodes; allowing a portion of said ions to undergo charge-exchange collisions with background gas particles, comprised of said fusible gas, to produce become fast-neutral particles ~~s~~ lected from the group consisting of deuterium particles and tritium

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particles, ~~whereby such that~~ a portion of said fast-neutral particles pass through the said openings of ~~the said~~ semi-transparent cathode surfaces electrodes, and ~~whereby said such that~~ a high-pressure high-resistance gaseous discharge is sustained primarily through charged particle generation initiated by the said ions and said fast neutral particles; and generating neutrons from said high-pressure high-resistance gaseous discharge as a product of fusion collisions occurring between said ions and said background gas particles and between said fast-neutral particles and said background gas particles.

69.(Currently Amended) The method according to claim 68 wherein at least a portion of said background gas particles that experience collisions with said ions ~~or and said~~ fast-neutral particles are situated on a surface of a material within the vacuum chamber ~~at the time that they experience the collisions.~~

Claim 70 (Withdrawn).

71.(Currently Amended) The method according to claim 69, wherein ~~the~~ said portion of said background gas particles that are situated on a said surface ~~of a material~~ within the said vacuum chamber are attached to ~~the~~ said surface by physical adsorption.

72. (Currently Amended) The method according to claim 68, wherein ~~the~~ said chamber and said electrodes have a shape selected to produce said neutrons with a spatial distribution dependent on the volume occupied by said high-pressure high-resistance discharge volume within the said shape.

73. (Currently Amended) The method according to claim 68, further comprising the step of employing an electron management system to augment the neutron production power efficiency of ~~the said method through~~ high-pressure high-resistance gaseous discharge by adjustment of said bias voltage resulting in the reduction of space-charge buildup and power consumed by the production or conduction of electrons through the gaseous discharge in said high-pressure high-resistance gaseous discharge.

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Claim 74 (Withdrawn).

Claim 75 (Withdrawn).

76. (Currently Amended) The method according to claim 73 wherein ~~the~~ said electron management system further comprises baffle electrodes, comprising electrically-conductive material with an electrical connection selected from the group of electrically floating or electrically connected to said leeching electrode, situated within said intra-cathode region to minimize intra-cathode region further inhibit space charge build up and to intercept errant particle and electron paths for minimization of electron generation.

Claim 77 (Withdrawn).

Claims 78-161 (Cancelled).